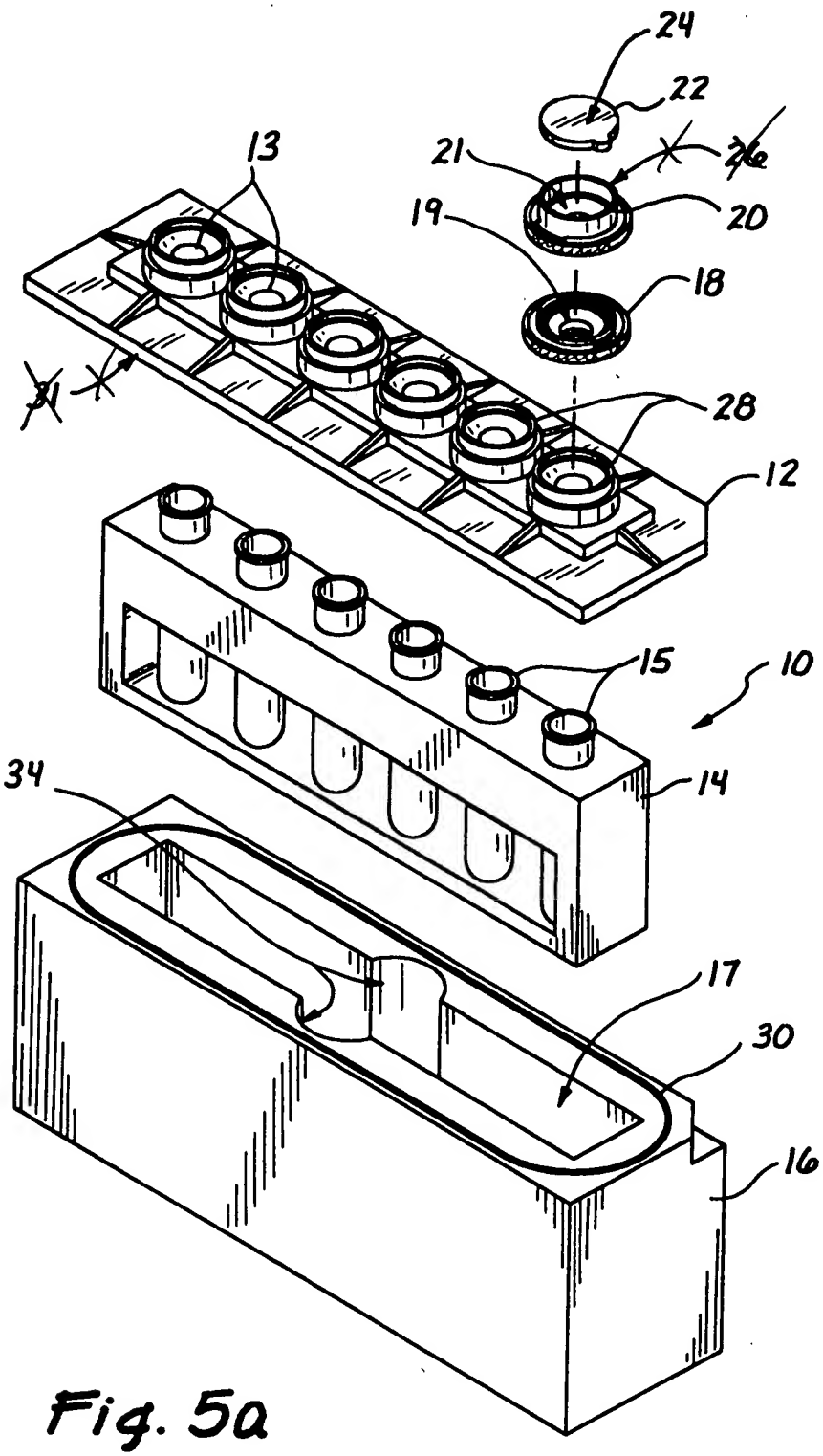


Fig. 5a

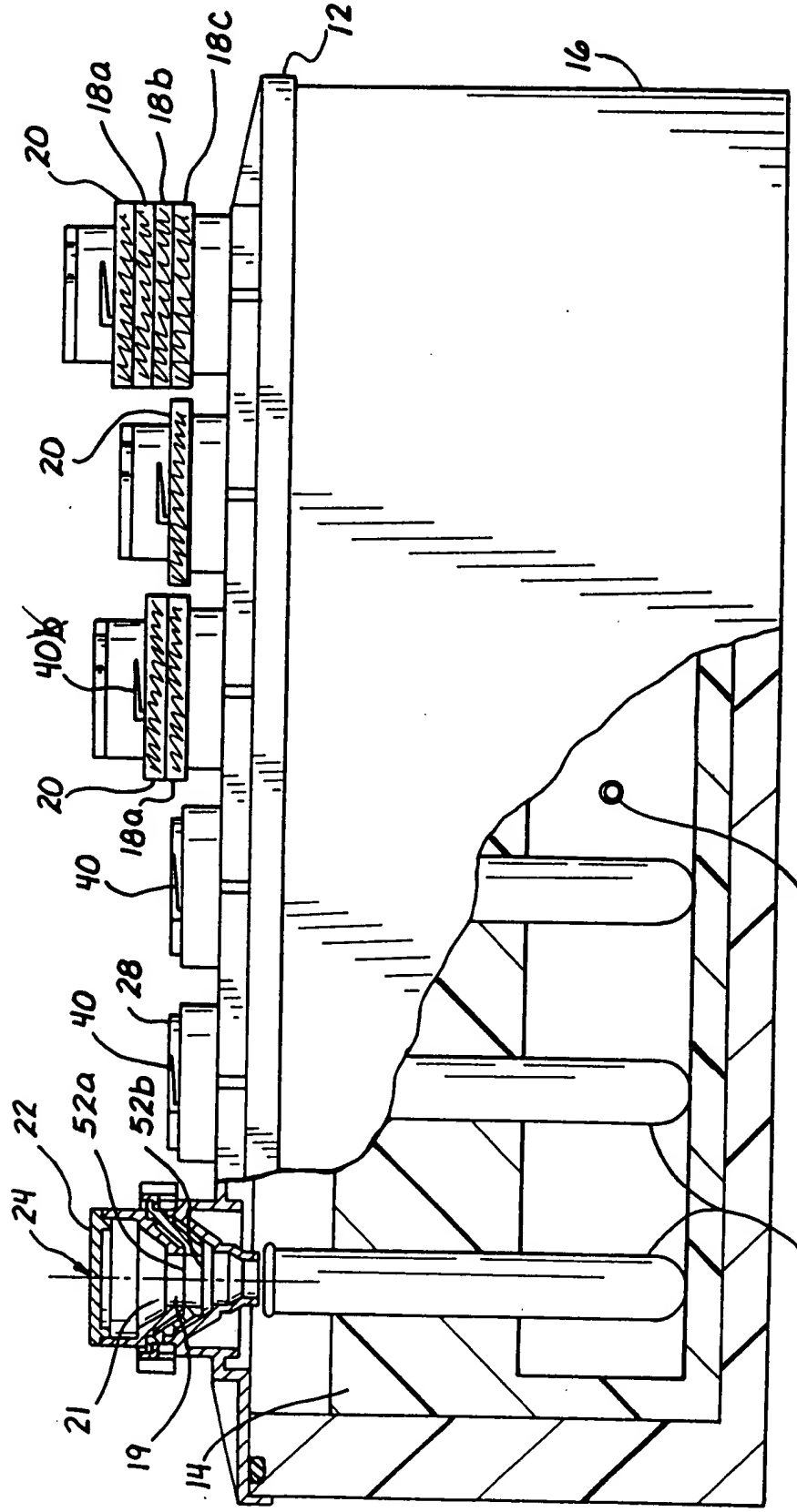

12
16
18c
18b
18a
20
20
40
20
18a
40
28
40
52b
52a
22
24
21
19
14
32
15

Fig. 6

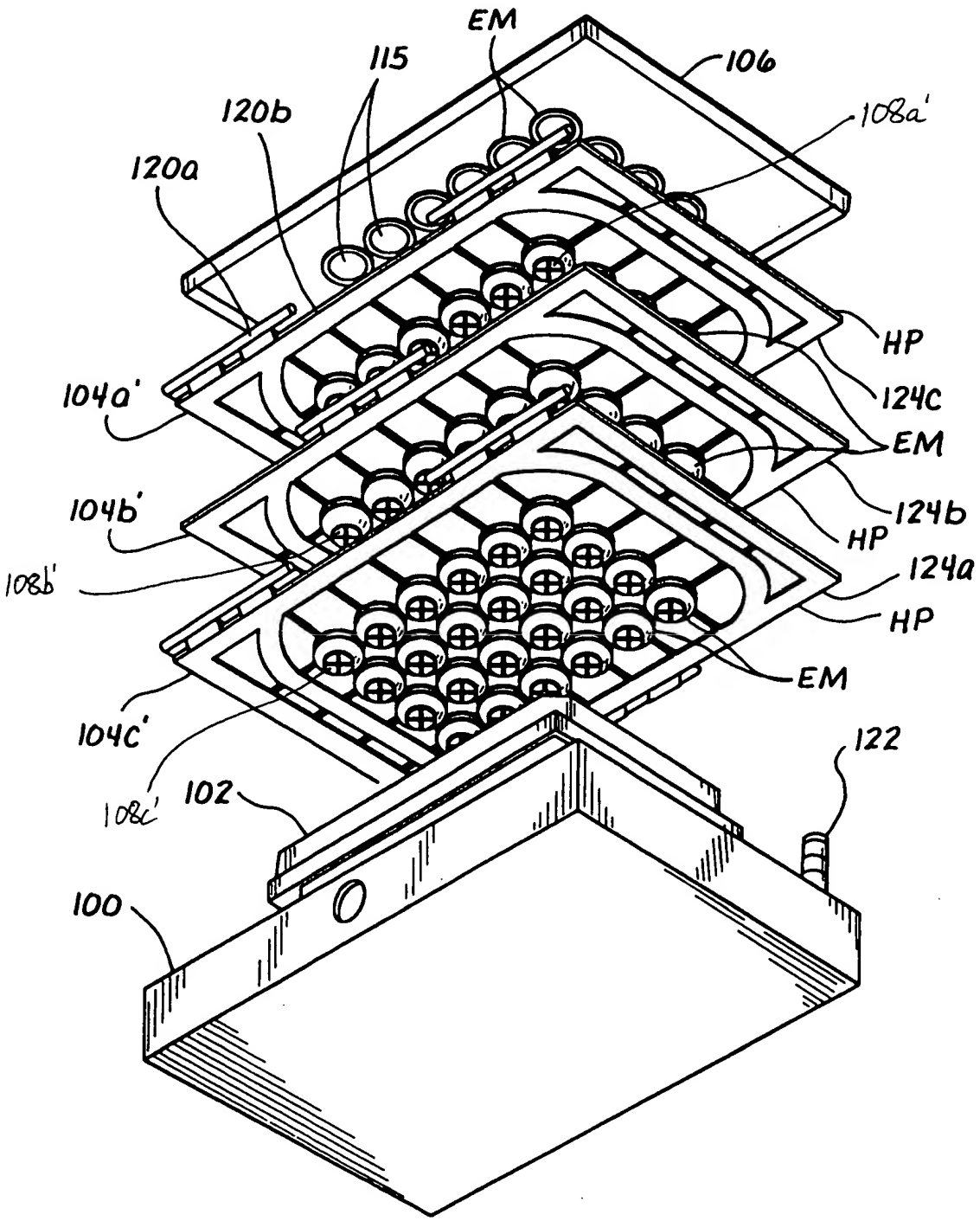

EM
115
106
120b
108a'
120a
HP
124c
104a'
EM
124b
104b'
HP
108b'
124a
HP
EM
104c'
122
108c'
102
100

Fig. 10a

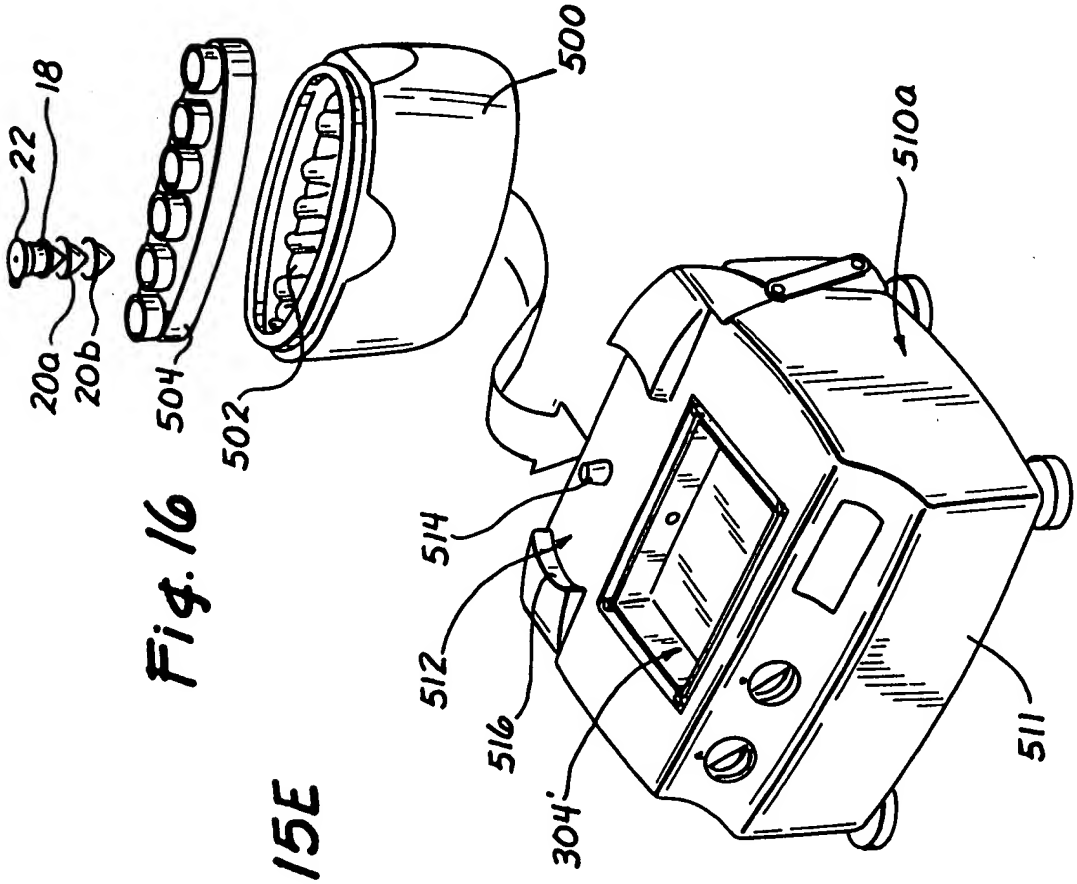


Fig. 16

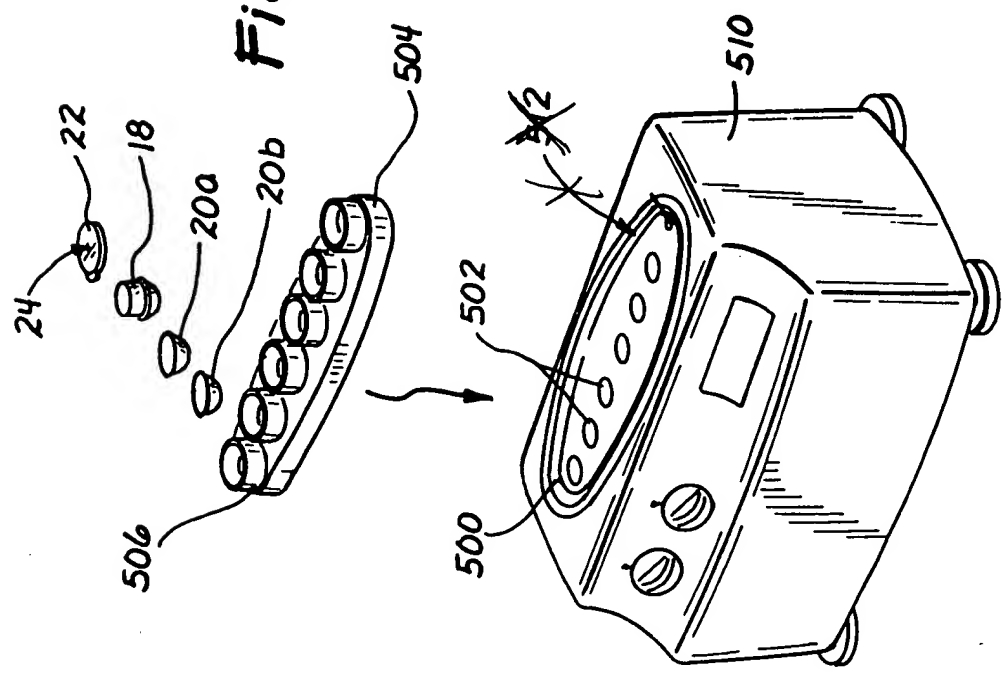


Fig. 15E

TABLE 1

~~Appendix I~~

1. New Tests

	Analytes	Typical Matrix	Membranes				Reagents				Detection Method	Comments
			M_1	M_2	M_3	M_4	R_1	R_2	R_3	R_4		
1.	FFA*, FFA^	Oil Fish Bakery Fast Food Oil in Frying	With or without any other analytes or membrane MCE .45 or Durapore .45 to remove particulates				XO				Spectral 570 or (visual) or color wheel	
2.	LPO/FFA	Oil or olive	MCE	Nylon linked decasilyl polymers or silica to bind LPO			XO	XO and Fe^+ (acidified)			Spectral Spectral	
3.	LPO/FFA*	Oil	MCE	Silica			XO	reduced hemoglobin				
4.	LPO/FFA/MDA	Oil/Seafood	MCE	Silica	Diethylamine		XO	XO (Fe^+ Acidified)	MI		Spectral	
5.	LPO, MDA, FFA after oxidative stress	Oil	MCE	Silica	Diethylamine		XO	XO (Fe^+ Acidified)	MI		% change proportional to shelf life Use visible meas. Color change	
6.	LPO, MDA, FFA After oxidative stress	Oil Fish Bakery	MCE to remove particulates	Silica to bind LPO	Diethylamine to bind MDA		XO	XO (Fe^+ acidified)	MI		Spectral	
7.	LPO after oxidative stress	Fish Oil	MCE	MCE			XO (Fe+ acidified)				Spectral	

FIG. 18A

1. New Tests

	Analytes	Typical Matrix	Membranes				Reagents				Detection Method	Comments
			M_1	M_2	M_3	M_4	R_1	R_2	R_3	R_4		
8.	FFA after Oxidative Stress	Oil	MCE				XO				Spectral	
9.	Polyphenol/LPO	Oil, Olives, Fruit, vegetables	MCE	Silica to bind LPO			Folin (Ciocalteau)	XO (fe^+ acidified)			Spectral	
10.	Polyphenol	Oil	MCE				Folin (Ciocalteau)				Spectral	
11.	Polyphenol and FFA	Oil Fruit Vegetables	MCE	Carboxymethyl to bind Polyphenol			XO	Folin Ciocalteau			Spectral	
12.	Polyphenol MDA/LPO/FFA	Oil Fruit Vegetable	0.8 um to bind particulates	Silica or nylon with lipid solubilizing decilsyler to bind LPO	Caroxy methyl weakly acidic membrane to bind polyphenols	diethylamine to bind MDA	XO	XO (Fe^+ acidified)	Folin (iocalteau)	MI	Spectral	
13.	LPO Ratio for Antioxidant Status	Oil Fish	MCE				XO/Fe+ acidified				Spectral	
14.	Unsaturated linkage/LPO Value	Oil	MCE	Lipid solubilizing polymer attached nylon bind LPO			$I_3 \rightarrow I_2$	XO (acidified Fe)			Spectral	
15.	Unsaturated linkage, MDA	Oil	MCE	diethylamine			$I_3 \rightarrow I_2$	MI			Spectral	
16.	LPO, FFA, Histamine*	fish beverage	MCE	Sulfonic Acid	Silica		XO	DAO and XO+(Fe+ acidified)	XO (Fe+ acidified)		Spectral	

FIG. 18B

1. New Tests

Analytes		Typical Matrix	Membranes				Reagents				Detection Method	Comments
			M_1	M_2	M_3	M_4	R_1	R_2	R_3	R_4		
17.	LPO/FFA/MDA	Fish beverage	MCE for particulates	Diethylamine to bind aldehydes for MDA	Lipid solubilizing polymer bound nylon to bind LPO		XO test for FFA	MI test for MDA	XO (Fe^+ acidified) LPO		Spectral	
18.	LPO/Histamine**	fish cheese sausage	MCE	Biodyne C or Sartobind Q for histamine binding			XO Fe^+ acidified	diamine oxidase and XO Fe (acidified)			Spectral	
19A	Polymer vs. non-polymer triglycerides	Cooking Oils	Membrane with MW Cutoff 500				Lipase with glycerol kinase +	detect H_2O_2 with chromogen			Spectral	
19B	Polymer vs. non-polymer Oxidized trigly	Cooking Oil	MW cutoff 500				Lipase/glycerol 3 PO_4 oxidase				Spectral	
20.	Mycotoxins1, Mycotoxins2 Mycotoxin 3	Grain	MCE	mab_1 bound NH_2 on regen cellulose	mab_2 bound NH_2 on regen cellulose	mab_3 bound NH_2 on regen cellulose	Mycotoxin1 enzyme conjugate	Mycotoxin2 enzyme conjugate	Mycotoxin3 enzyme conjugate (peroxidase mycotoxin conjugate) Measure H_2O_2 produced		Spectral	
21.	MDA/Sulfite	beer wine	MCE Prefilter or versapor prefilter	IDA to remove pigments and metals	Sartobind Q to bind aldehydes		Fe^{+3} (XO) ↓ Fe^{+2} (XO) blue → yellow For sulfite	MI for MDA			Spectral	
22.	ATP Separation from ADP & AMP	fish other living materiel degradation	MCE Prefilter or negative adsorber	Diethylamine			ATP detected by bioluminesence detection luminol	ADP + AMP by bioluminescence detection luminol			Spectral	

FIG. 18C

1. New Tests

	Analytes	Typical Matrix	Membranes				Reagents				Detection Method	Comments
			M_1	M_2	M_3	M_4	R_1	R_2	R_3	R_4		
23.	Histidine/Histamine	fish	MCE	Carboxymethyl to bind histamine			TBPB detect histadine Tetrabromphenol blue	DAO + HRP + Methylene blue Detect Histamine			Spectral	
24.	Histamine	wine, fish	I minodi acediric acid to (bind pigments) remove metals	IDA membrane to bind metal			DAO + XO Fe^+ acidified				Spectral	
25.	Separation histamine* from all rest amines	Fish Sausage Cheese	I minodi acetic acid remove metals	Sulfonic acid membrane bind other amines			DAO + XO Fe^+ acidified	measure rest amines using Xylidyl blue			Spectral	
26.	Total Polar Compounds	Cooking Oil	Silica to bind polar				quanitate non-polar lipase and ***	quanitate polar lipase ***			Spectral	
27.	Total Polar Compounds	Cooking Oil	Bind non-polar to hydrophobic membrane				quanitate polar ***	quantitate non-polar ***			Spectral	
28.	FFA or biliary acids	plasma or serum cows,humans	MCE to remove rbc etc. lipo proteins				XO to test for FFA				Spectral	

* Proprietary

** After Stress

*** lipase → glycerol and ATP → glycero kinase and pyruvate kinase lactate dehydrogenase

^called acidity value fish, bakery, wine

FIG. 18D

Analytes		Typical Matrix	Membranes				Reagents				Detection Method	Comments
			M_1	M_2	M_3	M_4	R_1	R_2	R_3	R_4		
29.	Polyphenol/FFA for prediction of adulteration	Oils	MCE	Carboxymethyl			XO	Folin Ciocalteau			Spectral	
30.	Polyphenol/FFA LPO to predict adulteration & aging	Oils	MCE	Carboxymethyl to bind polyphenol	Silica		XO	XO (Fe^+ acidified)	Folin Ciocalteau		Spectral	
31.	Polyphenol/FFA to predict adulteration	Oils	MCE	Carboxymethyl			XO	Folin Ciocalteau			Spectral	
32.	LPO/M DA/Acidity Irradiation	Oils Fish	MCE	Silica	diethylamine		XO	XO Fe^+ (acidified)	MI		Spectral	
33.	To Predict time for mycotoxin growth	grain	MCE				XO (Fe^+ acidified)				Spectral	
34.	FFA distribution	Oil predigested with lipase	MCE	Mab_1 to Oleic	Mab_2 Stearic	Mab_3 - Linoleic	XO	XO	XO		Spectral	Same ratio predict oil type oleic/stearic2/linoleic3
36.	Polyphenol/FFA/TG	Oil	MCE	Strong acid sulfonic bind ROH^+	Lipid solubilizing polymer bound nylon to lipid peroxides		XO	Folin Ciocalteau for polyphenol	Enzymatic determination triglyceride = Tg with lipase as in 19A.		Spectral	
37.	Anions	Beer	MCE	IDA			flush Fe Cl_3 replace anions change color				Spectral	
38.	Aldehyde, bisulfites	Beer	MCE	diethylamine			Fe^{+3} (XO) reduced by bisulfite	MI			Spectral	
39.	Protein, aldehyde	Beer	MCE	diethylamine			Commaassie Blue for protein	MI			Spectral	

FIG. 18E

Analytes		Typical Matrix	Membranes				Reagents				Detection Method	Comments
			M_1	M_2	M_3	M_4	R_1	R_2	R_3	R_4		
50.	Tetracycline Antibiotics in milk	Milk	MCE	decasilyl coated membrane			direct read at 365 nm				365nm Spectral	
51.	Aflatoxin	Milk and Aflatoxin Conjugate	MCE				Enzyme substrate = peroxidase aflatoxin conjugate and urea peroxide and tetramethybenzidine chromogen				Spectral	

PPO = Polyphenol

FIG. 18F

Others

	Analytes	Typical Matrix	Membranes				Reagents				Detection Method	Comments
			M_1	M_2	M_3	M_4	R_1	R_2	R_3	R_4		
52.	Microbes	Food	Versapor Particulates	IGN-6 binds microbes			Direct				Reflectance	
53.	Metals	Food	Versapor Particulates	IDA to bind Metal			Test for metals Zircon Zincon + Metal → deep blue				Spectral	

	Analytes	Typical Matrix	Membranes				Reagents				Detection Method	Comments
			M_1	M_2	M_3	M_4	R_1	R_2	R_3	R_4		
54.	Any Analytes	Food	Stacked bundle .8, .45 of M1 + M2++				Any of above				Spectral	

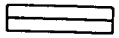
**Laminated  DEAE Cellulose
Nylon

FIG. 18G

LPO Reagent Only

2. Chemical /Personal Care

	Analytes	Typical Matrix	Membranes				Reagents				Detection Method	Comments
			M_1	M_2	M_3	M_4	R_1	R_2	R_3	R_4		
1	LPO, FFA, and MDA	Fragrance Oil	MCE	diethylamine	Silica		XO	MI	XO (Fe+ acidified)		Spectral	
2	LPO after oxidative stress to predict shelf life	Oil Skincare Product	MCE					XO (Fe+ acidified)			Spectral	
3	LPO after UV exposure to determine SP or UVA	Biological matrix cells	MCE					XO (Fe+ acidified)			Spectral	Test to UVA
4	LPO after stress formulation	Formulation with or without stress; compare formulation Trolox	MCE					XO (Fe+ acidified)			Spectral	Test efficacy
5	LPO	Oxidative stressed cells digest	Versapor					XO (Fe+ acidified)			Spectral	Oxidative stress prediction mode of action

Stress "toxicant" take sample before and after stress

FIG. 18H

3. Medical

	Analytes	Typical Matrix	Membranes				Reagents				Detection Method	Comments
			M_1	M_2	M_3	M_4	R_1	R_2	R_3	R_4		
1.	VLDL LDL HDL	Serum	Membrane 300,000 MW trap VLDL	Membrane 100,000 MW cut-off trap LDL	Membrane 10,000 MW cut-off trap HDL		quant VLDL cholesterol	LDL cholesterol	HDL cholesterol		Spectral 510	
							(Use cholesterol oxidase end substrate)					
2.	LDL and oxidized LDL (LDL)	Serum	300,000 MW cut-off membrane	LDL-Trapped diethyl amine			LDL cholesterol detection	Rinse LDL-Cholesterol detection oxidized			Spectral 510	
3.	LPO to determine AOS	Serum	MCE				XO Fe^+ Acidified				Spectral	
4.	LPO in serum to determine age	Serum	MCE				XO Fe^+ Acidified				Spectral	
5.	FFA	Serum	MCE				XO				Spectral	

FIG. 18F

~~Appendix II~~

TABLE II

Key to Acronyms

AOS	Antioxidant Status
ADP	Adenosine Triphosphate
AMP	Adenosine Monophosphate
ATP	Adenosine Triphosphate
DAO	Diamine Oxidase
FFA	Free Fatty Acids
HA	Histamine
HDL	High Density Lipoproteins
HRP	Horseradish Peroxidase
I_2	Iodine Vapor
I_3	Triodide Ion
IDA	Iminodi Acedtic Acid Membrane
LDL	Low Density Lipoproteins
LDL-	Oxidized Low Density Lipoproteins
LPO	Lipid Peroxides
Mab	Monoclonal Antibody
MCE	Mixed Cellulose Ester
MDA	Malonaldehydes
MI	Methylindole
SP	Sun Protector Factor
TBPB	Tetra Bromophenol Blue
TG	Triglyceride
TL	Total Lipids
SF	Sulfite
VLDL	Very Low Density Lipoproteins
XO	Xylenol Orange

FIG. 19

TABLE III

Appendix III

SHLEICHER & SCHUELL, GmbH P.O. Box 4, D37582, Dassel, Germany	APPLICATION Removal of solid matter, proteins >.45 mm
1. Cellulose Acetate, 0.45 um's 25 mm discs - 23710	Removal of solid matter, proteins
2. Polyvinylidene Fluoride, 0.2 um's, 25 mm disks - 413005	Antibody coating
3. NA45 DEAE Cellulose Membrane, 0.45 um's, 25 mm discs - 23310	Capture aldehydes
4. NA45 DEAE Cellulose Membrane, 0.45 um's, 4x51/4 inches - 23430	Capture of malonaldehyde, sulfites, sulfite-bound aldehydes
5. Nylon, 0.45 um's, 25mm discs - 00130	Removal of solid matter, proteins >.45 mm
6. Nylon, 0.2 um's, 25 mm discs - 00030	Removal of solid matter, proteins >.2 mm
7. NL Polyamide	Capture organohalides
8. PC Polycarbonate	Capture aldehydes
Poretics Coporation 111 A Lindbergh Ave., Livermore, CA 94550	APPLICATION
1. MicroPrep, PTFE, PP, NS, 0.2 um's, 13 mm - 97844	Capture compounds having fatty acid chains lipid peroxides
2. MicroSpin, Nylon, 0.45 um's, Micro-Cent. tubes - 97795	Removal of solid matter, proteins
3. Ultra-Spin, CTA, PP S, 10k MWCO, Micro-Cent Tubes - 97771	Removal of solid matter, proteins
4. Silver Membranes, 0.4 um's, 25mm - 51133	Capture of volatiles
5. Polycarbonate Membranes, 0.4 um's, 25 mm, PVP Free - 11030	Capture aldehydes
6. Polycarbonate Membranes, 0.4 um's, 25 mm, AOX - 11027	Capture chlorinated molecules
7. Polycarbonate Membranes, 0.45 um's 47 mm, Low extr. - 13035	Capture aldehydes
8. Polycarbonate Membranes, 0.2 um's, 8" x 10", PVP Free - 19416	Capture aldehydes
MILLIPORE CORPORATION 80 Ashby Rd., Bedford, Ma 01730-2271	APPLICATION
1. Isopore, 0.1 um's, 25 mm discs - VCTP 025 00	Removal of solid matter proteins
2. Immobilon-CD, 0.45 um's, 25mm discs, Cationically charged (hydrophilic PVDF) - ICDM 025 00	Removal of solid matter proteins
3. Low water Extractable (TF) filters, 0.45 um's, 25 mm discs - HATF 025 00	Removal of solid matter without binding organic molecules
4. Hydrophilic Durapore, 0.45 um's, 25 mm discs - HVL-025 00	Removal of solid matter proteins
5. Immobilon (hydrophobic PVDF) high protein binding, 0.45 um's, 25 mm discs - ISEQ 025 00	Capture aldehydes
6. Isopore, HTTP (polycarbonate), 0.4 um's, 25 mm discs - HTTP 025 00	Capture aldehydes
7. Immobilon-P Transfer Membranes (PVDF), 0.45 um's, 15 cm x 15 cm - IPVH 151 50	Coating with antibodies to capture or remove antibody specific compounds
8. Immobilon Transfer Membranes (PVDF), 0.45 um's, 15 cm x 15 cm - ICDM 151 50	Coating with antibodies to capture or remove antibody specific compounds
9. Immobilon NC Pure, 0.22 um's, 15 cm x 15 cm - INCP 151 50	Coating with antibodies to capture or remove antibody specific compounds
10. Immobilon-NC (Surfactant free), 0.45 um's, 15 cm x 15 cm HATF 151 50	Coating with antibodies to capture or remove antibody specific compounds
11. MultiScreen - DEAE Anion Exchange Paper Opaque 96 well plates - MADE NO8 10	Capture aldehydes
12. MultiScreen - Phospho Cellulose Cation Exchange Paper Opaque 96 well plates MAPH NO8 10	Bind lipid peroxides for capture
13. SC X	MW Cutoffs timer polymers triglyceria
14. Polysulfone	Amino acids, peptides proteins
15. IGN-6	Microbes
16. ICE 450	Bind nucleotides DNA
Sartorius 131 Hearland Blvd., Edgewood, NY 11717	APPLICATION
1. Sartoband S	Bind monoclonabe antibodies, etc.
2. Sartoband C	Exdoxtin removal
3. Sartoband Q	Separate proteins anines
4. Sartoband D	DNA ADP ATP AMP
5. Sartoband IDA	Metals; cations
Gelman/Pall 600 South Wagner Road, Ann Arbor, MI 48103-9019	APPLICATIONS
1. Versapor	Prefilter contaminants
2. Ultrabind 05450	Bind monoclonal antibodies, etc.
3. Biodyne C	Separation proteins
4. Biodyne B	Endotoxins nucleotide separation

FIG. 20

~~Appendix IV~~

TABLE IV

Predictive Algorithms

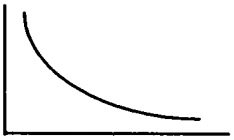
1.	Prediction of Olive Oil Adulteration using product FFA X Polyphenol Please refer to row 29 of Appendix I.	FFA X Polyphenol = Numerical Scale > 50 not adulterated < 50 likely adulterated
2.	Shelf Life Prediction based on MDA/LPO ratio	MDA/LPO is a scale 0 to 5 0-0.5 67% shelf life remains 0.5-1 33% shelf life remains 1-2 15% shelf life remains >2 5% shelf life remains
3.	Shelf Life Prediction based stress with peroxyl generator	% change related to shelf life 0-10% >18 months 10-30% 12-18 months 30-50% 6-12 months >50% < 6 months
4.	Freeze/Thaw Prediction using ratio Acidity/LPO	Ratio Freeze/Thaw 0-0.2 one 0.2-0.4 two 0.4-0.6 three 0.6-0.8 four
5.	Prediction of time to Myeotoxin contamination using LPO value Please refer to row 33 of Appendix I.	LPO  Time to Contamination
6.	Prediction if food is Irradiated using FFA/LPO ratio	Food non-irradiated has expected FFA/LPO of <1 Food Irradiated increases FFA/LPO >1

FIG. 21